

IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Canceled).

Claim 2 (New): A microscope for observing a fluorescent specimen having a plurality of fluorophores comprising:

an epifluorescent microscope having optics and an optical pathway;

a source of excitation light;

a high speed wheel driven by a wheel controller, the wheel having a center axis bisecting a predetermined reflection angle within an epifluorescent optical pathway of the microscope optics and being mounted for rotation about the center axis;

a plurality of dichroic beamsplitters mounted to the wheel; and

a computer control, the wheel controller being responsive to the computer control, wherein the computer control is programmed to command the high speed wheel to rotate different ones of the plurality of dichroic beamsplitters into the fluorescent optical pathway thereby positioning each of a selected plurality of the dichroic beamsplitters in the optical pathway to image each of a selected plurality of particular fluorophores in the specimen.

Claim 3 (New): A microscope as in claim 2 further comprising:

an excitation filter placed between the illumination source and the dichroic beamsplitter, the excitation filter transmitting at least one selected wavelength of light from the illumination source; and

an emission filter placed in the optical pathway such that light transmitted through the dichroic beamsplitter passes through the emission filter, light from the illumination source passing to the specimen under observation without passing the

emission filter, the emission filter transmitting at least one selectable wavelength of light, at least one of the separate excitation filters and emission filters being selectable to change filter wavelength parameters, thereby providing selection of a particular dichroic beamsplitter and at least one of the excitation and emission filters, wherein changing of the filters may be simultaneously executed, except in cases where it is desired to retain the same dichroic beamsplitter while changing one of the excitation and emission filters.

Claim 4 (New): A microscope as in claim 2, wherein

the wheel controller comprises a DC stepper motor.

Claim 5 (New): A microscope as in claim 2, wherein

the wheel controller comprises a galvanometer.

Claim 6 (New): A microscope as in claim 2, wherein filters comprising a first set are used as excitation filters and filters comprising a second set are used as emission filters, said excitation filters and said emission filters being provided as notch filters which cooperate with respectively selected dichroic beamsplitters in order to selectively image a particular fluorescent source.

Claim 7 (New): A microscope as in claim 2, further comprising:

an excitation filter placed between the illumination source and the dichroic beamsplitter, the excitation filter transmitting at least one selected wavelength of light from the illumination source; and

an emission filter placed in the optical pathway such that light transmitted through the dichroic beamsplitter passes through the emission filter, light from the illumination source passing to the specimen under observation without passing the emission filter, the emission filter transmitting at least one selectable wavelength of light, at least one of the separate excitation filters and emission filters being selectable to change filter

wavelength parameters, thereby providing selection of a particular dichroic beamsplitter and at least one of the excitation and emission filters, wherein changing of the filters may be simultaneously executed, except in cases where it is desired to retain the same dichroic beamsplitter while changing one of the excitation and emission filters.

Claim 8 (New): A microscope as in claim 7, wherein

the wheel controller comprises a DC stepper motor.

Claim 9 (New): A microscope as in claim 7, wherein

the wheel controller comprises a galvanometer.

Claim 10 (New): A microscope as in claim 7, wherein:

a dichroic beamsplitter is provided as a multiple cut-off beamsplitter; and

the computer control permits selectively changing the dichroic beamsplitters and excitation filter.

Claim 11 (New): A microscope for observing a fluorescent specimen comprising:

an illumination source;

microscope optics in an optical pathway for generating a magnified image of a specimen comprising one or more fluorescent materials;

a beamsplitter changer comprising a plurality of dichroic beamsplitters arranged about a center axis parallel to a line bisecting a predetermined reflection angle to the optical pathway and mounted for rotation about the center axis to allow positioning a selected one of the dichroic beamsplitters in the optical pathway, said optical pathway resulting in reflection of light from the illumination source to the specimen, and transmitting light received through the microscope optics from the specimen, wherein, when the selected dichroic beamsplitter corresponds to a particular fluorescent material under observation, the dichroic beamsplitter reflects illumination light at an excitation wavelength corresponding to

the fluorescent material under observation and the dichroic element transmits light shifted in wavelength by a Stokes shift of the fluorescent material under observation;

at least one color-limiting filter within the optical pathway, the color-limiting filter including a mechanism for changing an admitted wavelength independently of the positioning of the selected ones of the dichroic beamsplitter elements;

a motor and motor controller for rapidly effecting the positioning of the dichroic beamsplitters by rotating the beamsplitter changer about the center axis; and

a computer control, the motor controller being responsive to the computer control, wherein the computer control is programmed to command the motor controller to cause the motor to rotate different ones of the plurality of dichroic beamsplitters into the fluorescent optical pathway, thereby positioning each of a selected plurality of the dichroic beamsplitters in the optical pathway to image a each of a selected plurality of particular fluorophores in the specimen.

Claim 12 (New): A microscope as in claim 11, wherein:

a dichroic beamsplitter is provided as a multiple cut-off beamsplitter; and
the computer control permits selectively changing the dichroic beamsplitters and excitation filter.

Claim 13 (New): A microscope as in claim 11, wherein the color-limiting filter includes filters comprising a first set that are used as excitation filters and filters comprising a second set that are used as emission filters, said excitation filters and said emission filters being provided as notch filters which cooperate with respectively selected dichroic beamsplitters in order to selectively image a particular fluorescent source.

Claim 14 (New): A microscope as in claim 11, wherein:

a dichroic beamsplitter is provided as a multiple cut-off beamsplitter; and

the computer control permits selectively changing the dichroic beamsplitters and excitation filter.

Claim 15 (New): A microscope as in claim 11, further comprising:

an excitation filter placed between the illumination source and the dichroic beamsplitter, the excitation filter transmitting at least one selected wavelength of light from the illumination source; and

an emission filter placed in the optical pathway such that light transmitted through the dichroic beamsplitter passes through the emission filter, light from the illumination source passing to the specimen under observation without passing the emission filter, the emission filter transmitting at least one selectable wavelength of light, at least one of the separate excitation filters and emission filters being selectable to change filter wavelength parameters, thereby providing selection of a particular dichroic beamsplitter and at least one of the excitation and emission filters, wherein changing of the filters may be simultaneously executed, except in cases where it is desired to retain the same dichroic beamsplitter while changing one of the excitation and emission filters.

Claim 16 (New): A microscope as in claim 15, wherein

filters comprising a first set are used as excitation filters and filters comprising a second set are used as emission filters,

said excitation filters and said emission filters being provided as notch filters which cooperate with respectively selected dichroic beamsplitters in order to selectively image a particular fluorescent source.

Claim 17 (New): A microscope as in claim 11, wherein

the wheel controller comprises a DC stepper motor.

Claim 18 (New): A microscope as in claim 17, wherein filters comprising a first set are used as excitation filters and filters comprising a second set are used as emission filters, said

excitation filters and said emission filters being provided as notch filters which cooperate with respectively selected dichroic beamsplitters in order to selectively image a particular fluorescent source.

Claim 19 (New): A microscope as in claim 11, wherein

the wheel controller comprises a galvanometer.

Claim 20 (New): A microscope as in claim 19, wherein filters comprising a first set are used as excitation filters and filters comprising a second set are used as emission filters, said excitation filters and said emission filters being provided as notch filters which cooperate with respectively selected dichroic beamsplitters in order to selectively image a particular fluorescent source.

Claim 21 (New): A microscope as in claim 11, wherein:

the motor for rapidly effecting the positioning of the dichroic beamsplitters is a DC stepper motor under computer control;

filters comprising a first set are used as excitation filters and filters comprising a second set are used as emission filters, said excitation filters and said emission filters being provided as notch filters which cooperate with respectively selected dichroic beamsplitters in order to selectively image a particular fluorescent source; and

the filters comprising the first set and the filters comprising the second set are each positioned in the optical pathway by a motor and a motor controller under computer control.

Claim 22 (New): A microscope as in claim 11, wherein:

the motor for rapidly effecting the positioning of the dichroic beamsplitters is a galvanometer under computer control;

filters comprising a first set are used as excitation filters and filters comprising a second set are used as emission filters, said excitation filters and said emission filters being

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provided as notch filters which cooperate with respectively selected dichroic beamsplitters in order to selectively image a particular fluorescent source; and

the filters comprising the first set and the filters comprising the second set are each positioned in the optical pathway by a motor and a motor controller under computer control.